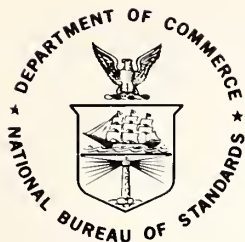


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Voluntary Product Standard PS 58-73

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

BASIC HARDBOARD



American National
Standards Institute

American National Standard A 135.4-1973

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The National Bureau of Standards¹ was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Institute for Computer Sciences and Technology, and the Office for Information Programs.

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¹ Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.

² Part of the Center for Radiation Research.

³ Located at Boulder, Colorado 80302.

⁴ Part of the Center for Building Technology.

UNITED STATES DEPARTMENT OF COMMERCE • Frederick B. Dent, *Secretary*

NATIONAL BUREAU OF STANDARDS • Richard W. Roberts, *Director*

Voluntary Product Standard PS 58-73 Basic Hardboard

Approved by the American National Standards Institute on
December 18, 1973, as American National Standard A135.4-1973

Abstract

This Voluntary Product Standard covers requirements and methods of test for water resistance, modulus of rupture, tensile strength, surface finish, dimensions, squareness, edge straightness, and moisture content of five classes of basic hardboard. Methods of identifying hardboard that conforms to the standard are provided.

Key words: Basic hardboard; hardboard.

Nat. Bur. Stand. (U.S.), Prod. Stand. 58-73, 6 pages (June 1974)
CODEN: XNPSAX

VOLUNTARY PRODUCT STANDARDS

Voluntary Product Standards are developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The purpose of the standards is to establish nationally recognized requirements for products, and to provide all concerned interests with a basis for common understanding of the characteristics of the products. The National Bureau of Standards administers the *Voluntary Product Standards* program as a supplement to the activities of the private sector standardizing organizations.

Establishment of a VOLUNTARY PRODUCT STANDARD

The role of the National Bureau of Standards in the establishment of a *Voluntary Product Standard* is to (1) act as an unbiased coordinator in the development of the standard, (2) provide editorial assistance in the preparation of the standard, (3) supply such assistance and review as is required to assure the technical soundness of the standard, (4) seek satisfactory adjustment of valid points of disagreement, (5) determine the compliance with the criteria of the Department's procedures, (6) provide secretarial functions for each committee appointed under the Department's procedures, and (7) publish the standard as a public document.

Producers, distributors, users, consumers, and other interested groups contribute to the establishment of a *Voluntary Product Standard* by (1) initiating and participating in the development of the standard, (2) providing technical or other related counsel as appropriate relating to the standard, (3) promoting the use of and support for the standard, and (4) assisting in keeping the standard current with respect to advancing technology and marketing practices.

Use of a VOLUNTARY PRODUCT STANDARD


The use of a *Voluntary Product Standard* is voluntary; the National Bureau of Standards has no regulatory power in the enforcement of the provisions of the standards. However, since the standards represent a consensus of all interested groups, their provisions are likely to become established as trade customs. In addition, when a standard is made a part of a legal document, such as a sales contract or code, compliance with the standard is enforceable.

The benefits derived from *Voluntary Product Standards* are in direct proportion to their general recognition and actual use. Producers and distributors whose products meet the requirements of a Voluntary Product Standard may refer to the standard in advertising and on labels to promote greater public understanding of or confidence in their products. Purchasers may order products conforming to the requirements of the standards.

For copies of the *Voluntary Product Standards* procedures or for more information concerning the development and use of these standards, you may write to: Office of Engineering Standards Services; National Bureau of Standards; Washington, D.C. 20234.

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Basic Hardboard

Effective October 23, 1973 (See section 4.)

(This Standard, which was initiated by the American Hardboard Association, has been developed under the *Procedures for the Development of Voluntary Product Standards* of the U.S. Department of Commerce as a revision of CS 251-63, *Hardboard*. See Section 5, *History of Project*, for further information.)

1. PURPOSE

The purpose of this Voluntary Product Standard is to establish nationally recognized dimensional and quality requirements for basic hardboard (see 2.2.1) and to provide producers, distributors, and users with a basis for common understanding of the characteristics of this product.

2. SCOPE AND DEFINITIONS

2.1. Scope—This Voluntary Product Standard covers requirements and methods of test for the water resistance, modulus of rupture, tensile strength, surface finish, dimensions, squareness, edge straightness, and moisture content of five classes of basic hardboard.¹ Methods of identifying hardboard that conforms to this Standard are provided.

Note: As an aid in correlating U.S. customary units to metric units, conversion factors for the units used in this Standard are given below:

1 inch = 25.4 millimeters

1 foot = 0.3048 meter

1 pound per square inch = $6.894\ 757 \times 10^3$ pascals (newtons/meter²)

2.2. Definitions—For the purposes of this Standard, the following definitions shall apply.

2.2.1. Hardboard—Hardboard is a panel manufactured primarily from inter-felted ligno-cellulosic fibers which are consolidated under heat and pressure in a hot-press to a density of 31 pounds per cubic foot or greater. Other materials may be added to improve certain properties, such as stiffness, hardness, finishing properties, resistance to abrasion, and moisture, as well as to increase strength, durability, and utility.

2.2.2. Smooth on one side (S1S)—A hardboard panel produced by the fibers being pressed in a damp or wet condition between a platen and a wire screen.

2.2.3. Smooth on two sides (S2S)—A hardboard panel produced by the fibers being pressed in a substantially dry condition between two platens.

3. REQUIREMENTS

3.1. General—All basic hardboard represented as complying with this Voluntary Product Standard shall meet all of the requirements specified herein. The inspection and test procedures contained in this section are to be used to determine the conformance of products to the requirements of this Voluntary Product Standard. Each producer or distributor who represents his products as conforming to this Standard may utilize statistically based sampling plans which are appropriate for each particular manufacturing process but shall keep such essential records as are necessary to document with a high degree of assurance his claim that all of the requirements of this Standard have been met. Additional sampling and testing of the product, as may be agreed upon between purchaser and seller, is not precluded by this section.

3.2. Classes—The hardboard shall be classified as shown in table 1, based on the physical properties listed therein. The properties shall be determined in accordance with the applicable test methods in Part B of American Society for Testing and Materials (ASTM) D 1037-72a, *Standard Methods of Evaluating the Properties of Wood-Base Fiber and Particle Panel Materials*,² except that, when testing modulus of rupture, specimens greater than 3/8 inch thick shall be spanned according to Part A, section 14 of this reference.

3.3. Surface finish—The smooth surfaces shall be as free from visible variations in the surface plane as commercially practicable when visually inspected by an individual competent in the field.

3.4. Dimensions and tolerances—The hardboard panels shall have a nominal width of 4 feet or 5 feet. The nominal length of the panels shall be as

¹ Other Voluntary Product Standards cover:
a. Prefinished hardboard paneling
b. Hardboard siding

² Later issues of this publication may be used providing the requirements are applicable and consistent with the issue designated. Copies are obtainable from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

agreed upon by the purchaser and the seller. The tolerance on the nominal width and length shall be plus or minus 1/64 inch per linear foot. The nominal thicknesses shall be as designated in table 1. Thickness tolerances shall be as specified in table 2 when measured in accordance with the applicable test method in Part B of ASTM D 1037-72a.

3.5. Squareness—The lengths of the face diagonals of the hardboard panels shall not vary by more than 1/64 inch for each foot of length of the panels. Opposite sides of the panels shall not vary in length more than 1/8 inch.

3.6. Edge straightness—The edges of the hardboard panels shall be straight within 1/64 inch for each foot of length or width. Edge straightness shall be determined by stretching a string or wire from one corner to the adjacent corner and measuring the widest distance between the string or wire and the panel edge being tested.

3.7. Moisture content—The moisture content of the hardboard shall be not less than 2.0 percent nor more than 9.0 percent and, within any one shipment, shall not vary by more than 3 percentage points as measured by the moisture content of the modulus of

TABLE 1. *Classification of hardboard by surface finish, thickness, and physical properties*

Class	Surface	Nominal thickness	Water resistance (max av per panel)				Modulus of rupture (min av per panel)	Tensile strength (min av per panel)	
			Water absorption based on weight		Thickness swelling			Parallel to surface	Perpendicular to surface
			S1S	S2S	S1S	S2S			
1 Tempered	S1S	<u>inch</u> 1/12	<u>percent</u> 30	<u>percent</u> —	<u>percent</u> 25	<u>percent</u> —	7000	3500	150
		S1S and S2S	1/10	20	25	16			
	1/8		15	20	11	16			
	3/16		12	18	10	15			
	1/4		10	12	8	11			
	5/16		8	11	8	10			
	3/8	8	10	8	9				
2 Standard	S1S and S2S	1/12	40	40	30	30	5000	2500	100
		1/10	25	30	22	25			
		1/8	20	25	16	18			
		3/16	18	25	14	18			
		1/4	16	20	12	14			
		5/16	14	15	10	12			
		3/8	12	12	10	10			
3 Service-tempered	S1S and S2S	1/8	20	25	15	22	4500	2000	100
		3/16	18	20	13	18			
		1/4	15	20	13	14			
		3/8	14	18	11	14			
4 Service	S1S and S2S	1/8	30	30	25	25	3000	1500	75
		3/16	25	27	15	22			
		1/4	25	27	15	22			
		3/8	25	27	15	22			
		7/16	25	27	15	22			
		1/2	25	18	15	14			
	S2S	5/8	—	15	—	12			
		11/16	—	15	—	12			
		3/4	—	12	—	9			
		13/16	—	12	—	9			
		7/8	—	12	—	9			
		1	—	12	—	9			
		1 1/8	—	12	—	9			
5 Industrialite	S1S and S2S	3/8	25	25	20	20	2000	1000	35
		7/16	25	25	20	20			
		1/2	25	25	20	20			
	S2S	5/8	—	22	—	18			
		11/16	—	22	—	18			
		3/4	—	20	—	16			
		13/16	—	20	—	16			
		7/8	—	20	—	16			
		1	—	20	—	16			
		1 1/8	—	20	—	16			

rupture specimens. Moisture content shall be determined in accordance with the applicable test method in Part B of ASTM D 1037-72a. (Since hardboard is a wood-base material, its moisture content will vary with environmental humidity conditions. When the environmental humidity conditions in the area of intended use are a critical factor, the purchaser should specify a moisture content range more restrictive than 2 to 9 percent, so that fluctuation in the moisture content of the panel will be kept to a minimum.)

TABLE 2. Thickness tolerances for hardboard panels

Nominal thickness	Thickness tolerance (min - max)
inch	inch
1/12 (.083)	0.070 - 0.090
1/10 (.100)	.091 - .110
1/8 (.125)	.115 - .155
3/16 (.188)	.165 - .205
1/4 (.250)	.210 - .265
5/16 (.312)	.290 - .335
3/8 (.375)	.350 - .400
7/16 (.438)	.410 - .460
1/2 (.500)	.475 - .525
5/8 (.625)	.600 - .650
11/16 (.688)	.660 - .710
3/4 (.750)	.725 - .775
13/16 (.812)	.785 - .835
7/8 (.875)	.850 - .900
1 (1.000)	.975 - 1.025
1 1/8 (1.125)	1.115 - 1.155

3.8. Marking—All basic hardboard which is represented as conforming to this Voluntary Product Standard shall be identified by either of the following methods:

(a) Each board shall be marked with a colored vertical stripe (or stripes) which indicates the class of the board. The marking for the different classes shall be as follows:

Class	Number and color of stripes
Tempered	1 Red
Service tempered	2 Red
Standard	1 Green
Service	2 Green
Industrialite	1 Blue

The stripe (or stripes) shall be applied to the four edges of a board as follows: On the short sides of the board, the stripe should be applied 3 inches from the left hand corner (as determined when the marker faces the side he is marking); on the long sides of the board, the stripe should be applied 3 inches from the right hand corner (as determined when the marker faces the side he is marking). See figure 1 for an example of the placement of the markings. Stripes shall be 1/2 inch in width. When two stripes are used they shall be 1 inch apart.

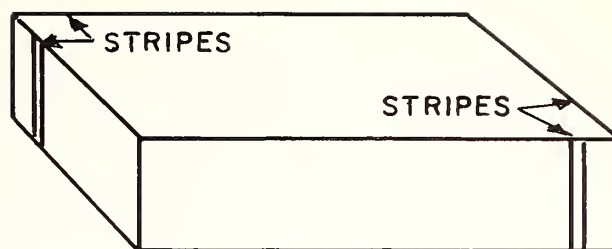


FIGURE 1. A stack of hardboard showing placement of marking.

(b) The shipment or order shall be accompanied by a written certification stating the class of the hardboard and that the hardboard conforms to the requirements of this Voluntary Product Standard, PS 58-73.

4. EFFECTIVE DATE AND IDENTIFICATION

The effective date of this Standard is October 23, 1973. After this date, the authority to refer to the superseded standard, CS 251-63, *Hardboard*, as a voluntary standard developed under the Department of Commerce procedures is terminated. As of the effective date, reference to PS 58-73 may be made in contracts, codes, advertising, invoices, product labels, and the like, but no product may be advertised or represented in any manner which would imply or tend to imply approval or endorsement of that product by the National Bureau of Standards, the Department of Commerce, or by the Federal Government.

The following statements are suggested for use in representing products as conforming to all requirements of this Standard:

- (1) "This class ____ hardboard conforms to all requirements established in Voluntary Product Standard PS 58-73, developed and published in accordance with the U.S. Department of Commerce *Procedures for the Development of Voluntary Product Standards*. Full responsibility for the conformance of this product to the standard is assumed by (name and address of producer or distributor)."
- (2) "Class ____ conforming to PS 58-73, (name and address of producer or distributor)."

5. HISTORY OF PROJECT

Commercial Standard CS 251-63, *Hardboard*, was developed at the request of the American Hardboard Association and was published in 1963.

In 1969, the American Hardboard Association requested that the National Bureau of Standards initiate a revision of CS 251-63 under the *Procedures for the*

Development of Voluntary Product Standards. A proposed revision was submitted to the Standing Committee in August 1972; the response from the Standing Committee indicated that certain changes to the standard were necessary. A new proposal was approved by the Standing Committee in May 1973; the recommended revision was then circulated for acceptance in July 1973. The response to this circulation indicated consensus among producers, distributors, and users in accordance with the published procedures.

The new edition of the Standard was designated Voluntary Product Standard PS 58-73, *Basic Hardboard*, and became effective on October 23, 1973.

Technical Standards Coordinator:

Karl G. Newell, Jr., Office of Engineering Standards Services, National Bureau of Standards, Washington, D.C. 20234

6. STANDING COMMITTEE

A Standing Committee has been appointed to assist in keeping this Voluntary Product Standard up to date. The names of the members of the committee are available from the Office of Engineering Standards Services, Washington, D.C. 20234, which serves as the secretariat of the committee.

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